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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/941,668	08/30/2001	Tetsuo Taniguchi	972-85	9543

7590

03/19/2003

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EXAMINER

NGUYEN, HUNG

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 03/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/941,668

Applicant(s)

TANIGUCHI, TETSUO

Examiner

Hung Henry V Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Response filed 3/7/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 32-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 32, 33 and 36-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-12 and 32-40 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08/871,881.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of group I in Paper No. 5 is acknowledged.
It is noted that group I should be claims 1-8, 32-33 and 36-40 instead of claims 1-8 and 32- 41 and group II should be claims 9-12 and 34-35 instead of 9-12, as indicated in the restriction requirement sent February 12, 2002. The Examiner regrets and apologizes for any inconvenience caused to the Applicant by this typographical error.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
3. Claims 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sumioshi et al (U.S.Pat. 6,014,455).

With respect to claims 36-40, Sumioshi et al (fig.1) discloses an exposure apparatus for projecting a predetermine image formed on a reticle (4) onto a photosensitive wafer (6) and comprising substantially all basic features of the instant claims such as: an imagery characteristic correction device (8) coupled to a projection optical system (5) for driving at least one lens of the projection optical system to correct the imagery characteristic of the projection optical system and a detecting means (7) for detecting the projection error of the projection optical system and a sensor for detecting any change in ambience temperature, pressure or humidity of the projection

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optical system (see col.4, lines 10-15). Sumioshi clearly teaches driving at least a lens of the projection optical system to get a first correction of an imagery characteristic of the projection optical system as recited in the instant claims. Sumioshi does not expressly disclose determining a displacement amount of an image forming position of the projected image formed via the projection optical system caused by a driven amount of the projection optical system. However, Sumioshi teaches that a driving of some lens groups of the projection optical system causes less change in error than a driving of other lens groups of the projection optical system (see col.6, lines 13-42). Accordingly, a lens groups to be moved is determined in order to minimize the overall errors of the projection optical system. Furthermore, Sumioshi suggests “a lens group (e.g., group G3) may be moved so as to cancel *a change in distortion which result from correction movement of a lens group* (e.g., group G1)” (see col.6, lines 55-65). In other words, at the time the patent application was filed, determining an amount of deviation of the projected image formed through the projection lens due to a driven amount of the projection lens was well known per se. In view of such teachings, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Sumioshi to obtain the invention as specified in the instant claims. It would have been obvious to a skilled artisan to determine a second correction based on “a change in distortion which result from correction movement of a lens group” as suggested by Sumioshi in order to properly correct the distortion error of the exposure apparatus and to improve the images to be printed.

4. Claims 1-8, 32-33 and 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable Ohta et al (U.S.Pat. 5,105,075).

With respect to claims 1-8, 32-33 and 36-40, Ohta discloses a projection exposure apparatus for projecting an image formed on a mask (1) onto a substrate (9) through a projection optical system (5) and comprising substantially all of the limitations of the instant claims such as: a substrate position detector (18) for detecting the position of the registration mark formed on the substrate; an imagery characteristic correction mechanism (108) coupled to the projection optical system for correcting a projection distortion of the projected image of the pattern by driving the mask and one or more lens elements of the projection optical system (see col.1, lines 45-50, see fig.1); a lens position detector (17) for detecting the position of the projection optical system; a reticle position detector (15); a pressure sensor (19), a temperature sensor (20), a humidity sensor (21) for detecting changes in pressure, humidity and temperature around the projection optical system, and a microprocessor (23) having a memory (see col.9, lines 50) for communicating with the substrate position detector, the imagery characteristic correction mechanism, the sensors for controlling the movement of the substrate, the mask, and the lens elements of the projection optical system for performing overall operations of the exposure device including a correction of the imagery characteristic of the projection optical system as recited in the claims of the instant application. Ohta does not specifically disclose determining a displacement amount of an image forming position of the projected image formed in accordance with a driven amount of the projection optical system by the imagery characteristic correction mechanism. However, this in itself does not provide any inventive steps and is well known in the prior art. For example, Ohta recognizes that displacement of the mask and a lens or lenses of the projection optical system for adjusting the imaging characteristic of the projection optical system can cause deterioration of various aberrations (see col.3, lines 25-33). This provides a

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concrete evidence that it would have been obvious to one having ordinary skill in the art at time the invention was made to take into account this suggestion and calculate a deterioration of an image forming position of the projected image formed due to displacement of the projection optical system. The purpose of doing so would have been to also compensate any distortion error of the projected image in accordance with the movement amount of the mask and/or the projection optical system whereby the quality of the images to be printed is greatly improved.

Prior Art Made of Record

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

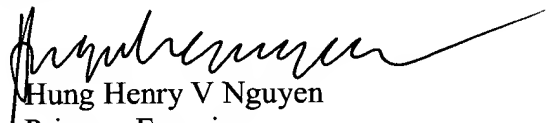
Suzuki (U.S.Pat. 6,416,913), Ishizaka et al (U.S.Pat. 4,801,977) and Tsuji et al (U.S.Pat. 5,424,552) disclose exposure apparatus, each of which comprises substantially all elements as recited in the instant claims.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V Nguyen whose telephone number is 703-305-6462. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.

Hvn
3/17/03


Hung Henry V Nguyen
Primary Examiner
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